range *Actinia abyssicola* and *A. gelatinosa*, found by Moseley at Amboina and at the Bermudas upon the deep-sea Isididæ.

Chitonactis Richardi must be reckoned amongst the largest of Actiniidæ, and finds its place in the family Bunodidæ. This genus, erected by Fischer, is characterized by its false epidermis, so that it is to the true *Bunodes* what *Phellia* is to *Sagartia*. The histological structure of *Chitonactis*, however, is very distinct from that of *Bunodes*. The ectoderm is formed of slender fusiform cells closely resembling one another. The column being thick and coriaceous, the mesoderm acquires a great development, and presents at its centre very numerous patches of annular muscular bundles identical with those of *Calliactis effœta*. The existence of so peculiar a histological conformation in these two Actiniidæ, perfectly distinct in other respects, evidently corresponds to the rigidity of the column, in which contraction cannot be effected except by bringing into play a mesodermal muscular system, represented, doubtless in a rudimentary manner, in several types, but offering here its maximum development.

Chitonactis Richardi has been met with in two totally different conditions, the influence of which has been sufficient to produce two very remarkable races. One is represented by large specimens fastened upon the branches of *Mopsea elongata*. The column is almost perfectly smooth ; and the cuticular deposits exist only upon the tubercles. The foot grasps the branches of the Isidian by extending tonguelets, or by folding over its two large lips. The other race includes rather smaller individuals, found rather nearer to the coast, and at a depth of only 306 metres. Their columns are entirely covered by cuticular lamellæ. These *Chitonactines* attach themselves directly to the sandy mud, in such a manner that the foot, not finding sufficient resistance, buries itself, producing an immense ampulla which resembles the extremity of the body of certain errant Actiniaria.

Thus this small collection of malacodermous Zoantharia possesses real interest. It merits special notice the more as the deep-sea species are still very little known. It is sufficient now to remark that Moseley has described only six abyssal forms at the termination of the prolonged expedition of the 'Challenger.'—*Comptes Rendus*, February 13, 1882, p. 458.

Colour in Autumn Leaves.

Mr. Thomas Meehan referred to an excursion to the Salt Marshes of New Jersey, organized by a member of the Academy, Mr. Isaac C. Martindale, and generously seconded by the Camden and Atlantic Railroad Company, which furnished a special train of twelve cars for the company, with the privilege of stopping along the road at interesting botanical points. This gave unusual opportunity to examine the vegetation of the Salt Marshes, which at this season of the year presented a scene of coloured beauty unequalled perhaps in the whole world.

Mr. Meehan remarked that the vegetation which for the most part made up this flora was either precisely the same as those which entered into the flora of similar localities in Western Europe, or else of species so closely allied that only critical examination would show the distinction. The plant which gave the greatest brilliancy, chiefly on account of its numerical proportions, was *Salicornia herbacea*, the same plant which abounds along European shores. To the rich rosy red of this species *Salicornia mucronata* (of Bigelow, *S. virginica* of most authors) added a rosy brown. Although this species is American, there are forms of *S. herbacea* on the English coast which approach it. The third species is *S. ambigua* of Michaux, a perennial species and the analogue of the British *S. radicans.* This one never changes its bright green colour till severe frost destroys it. The lively green very much enlivens the brilliancy of the orange, red, and brown in the other marsh-plants. The species precisely the same with those of England which gave colour to the marshes, besides these Salicornias, were *Salsola Kali*, *Suæda maritima*, *Atriplex patula*, *Polygonum maritimum*, *Spartina stricta*, *Spartina juncea*, and *Ammophila arenaria*—the three last, grasses which add much by their light browns to the richness of the whole. *Statice limonium*, by its faded blue-grey tint, gave a peculiar element to the colour. *Aster flexuosus*, closely related to *Aster trifolium* of European marshes, furnished a tint of purple-green. So far as could be observed of the many other species of plants which might be collected, these were the only ones giving character to the beautifully coloured picture the marshes presented at this time.

The most interesting inquiry here presents itself—Why should plants common in the main to both continents, colour so much more brightly in America than in Europe? We are reminded that what we see here in these marsh-plants does not hold good with close allies in other species. Among trees and shrubs there are some peculiar to each country, but closely allied, in which all the American allies colour, while the European rarely do. He named on the American side, *Betula populifolia*, *Fraxinus sambucifolia*, *Quercus alba*, *Cratægus cordata*, *Ulmus americana*, *Alnus serrulata*, *Castanea americana*, as against *Betula alba*, *Fraxinus excelsior*, *Quercus robur*, *Cratægus oxyacantha*, *Ulmus campestris*, *Alnus glutinosa*, and *Castanea vesca.* The whole American line had autumn colouring, of which the parallel European line was wholly destitute. These trees did not lose this characteristic by removal to the other continent. In America there were many of the European species five or ten generations from seed; and yet these last generations showed no more disposition to embrace the colour-characteristics of their American cousins than did the first progenitor brought from abroad. We were so accustomed to associate our bright clear autumn skies with the colour of our autumn foliage, that facts like these stagger us. Why should several generations of these European trees resist our climatal influences? But we have to remember that the colouring of fruits and foliage is not wholly the result of chemical power; what for want of a better name we know as vital power, claims a share.

Some apples have colour on the sunny side, while the rosy cheek never appears on those of the same variety hidden by the foliage;

and in these cases it is self-evident that sunlight is a cause of colour. Yet if we pluck such a variety from the tree, and place it in the sunlight, it will not colour; so that we see here that there must be a connexion with the living principle in the tree to enable the solar rays to act. Yet it requires a relaxation of the leaf's hold on life to bring out these colours. At any time during the summer a maturing leaf on an American tree exhibits bright colour; yet if a dying leaf, half-coloured, be plucked from the parent stem, there is no further change in the tint. Many leaves pass through grades, as green, light yellow, orange-brown to scarlet. If they are gathered at yellow or brown they remain yellow or brown, and so on all through these stages. Colouring, therefore, could not wholly be considered chemically; for though decay, which we take to be a chemical action, is going on during the colouring stage, complete separation from the living tree at once stops the process.

If we consider these two facts together, and then some other known natural laws, we may form some reasonable hypothesis. There is, for instance, the principle of heredity, so ably insisted on by Mr. Darwin, in connexion with all living things. A force once applied to an object exerts an influence after the power has been removed. A wheel runs round after the hand which turns it is taken away; and a change in a plant brought about by any circumstance will continue in connexion with that plant some generations after the circumstances have ceased to exist. That this is so has been proved by Naudin with hybrid (or perhaps we should say crossed) lettuces, and in other ways. Supposing, then, these closely allied species to have been originally of one parentage, how did the power in one case to change to bright colour, or in the other to resist the tendency to colour, originate? If by chemical power alone, it would occur at once, as a piece of white wood is at once browned by fire; but with the vital principle opposed to this chemically destructive principle, it would take more time to accomplish this change, and, the change once made, would again require more time to again alter the fixed condition. This is essentially the foundation of the law of heredity; and under its operation we could not reasonably look for a change in the colouring-power of these European trees, although light were an active agent, under even more than five or ten inheriting generations.

At any rate we have in these salt-marsh plants the evidence that the plants of one country, in that country colourless, can be made to take the most brilliant colours when growing in ours. That these plants had one primary origin is certain, though the ancestry may have been separated by thousands of years. We know that plants introduced at once do not change at once; heredity forbids it. We may assume, therefore, that it was only after some generations on the American coast, under the influence perhaps of American light, that these European plants showed their American colours. We can see in these annual plants, with a new generation every year, the results in numerous generations, as we cannot see in the more slowly reproducing tree.

Mr. Meehan thought that though we could not say we had yet reached an unchallengeable solution of the cause of autumn colour in American foliage, considerations like these brought us nearer to the end.—*Proc. Acad. Nat. Sci. Philad.*, Nov. 1, 1881.

Centrolophus pompilus.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—In your issue for this month Dr. Günther, when alluding to the capture of a Blackfish (*Centrolophus pompilus*) at the mouth of the Colne, observes that, so far as he is aware, "this is the first instance known of the fish having wandered so far eastwards."

In 1841, one 14 inches in length was taken at Lossiemouth; in 1850 Mr. Alder remarked on one captured at Cullercoats, in Northumberland; while in the 'Zoologist,' 1852 (p. 3504), Mr. Rudd mentions one obtained at Redcar, in Yorkshire.

Yours truly,
FRANCIS DAY.

P.S. The same example was recorded by Mr. Laver in the 'Zoologist,' 1882, p. 75.

Cheltenham, March 4, 1882.

On a Fœtal Kangaroo and its Membranes. By HENRY C. CHAPMAN, M.D.

Since the publication, nearly fifty years ago, of Prof. Owen's invaluable paper* "On the Generation of the Marsupial Animals," in which the fœtal Kangaroo and membranes were first described, no further contribution has been made to our knowledge of this very important subject. Indeed some naturalists at the present day seem indisposed to accept Prof. Owen's statement that there is no connexion in the Kangaroo between the fœtal membrane and the uterus, or, in other words, that no placenta is developed, and therefore doubt that the division of the Mammalia into non-placental and placental is not a valid one. Even though the present communication should not contain any thing particularly new, I trust, however, that it will not be received without interest, if for no other reason than that it confirms essentially Prof. Owen's descriptions.

One would have naturally supposed that, during the past half century, among all the Kangaroos killed in Australia and opened in various zoological gardens, at least one fœtal Kangaroo would have been found. As a matter of fact, however, this does not appear to have been the case; or, at least, if such was found, no record was made of it. Impressed with this fact, I never failed to examine the generative apparatus in the female Kangaroos which died from time to time in the Philadelphia Zoological Garden, with the hope that I might obtain an embryo. In September 1879 I was successful, finding the specimen which forms the subject of the

* Phil. Trans. 1834.